



# Stimulating Discussions on the Benefits of a Smarter Grid: The 3<sup>rd</sup> Grid Modernization Index

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# CLIMATE + ENERGY



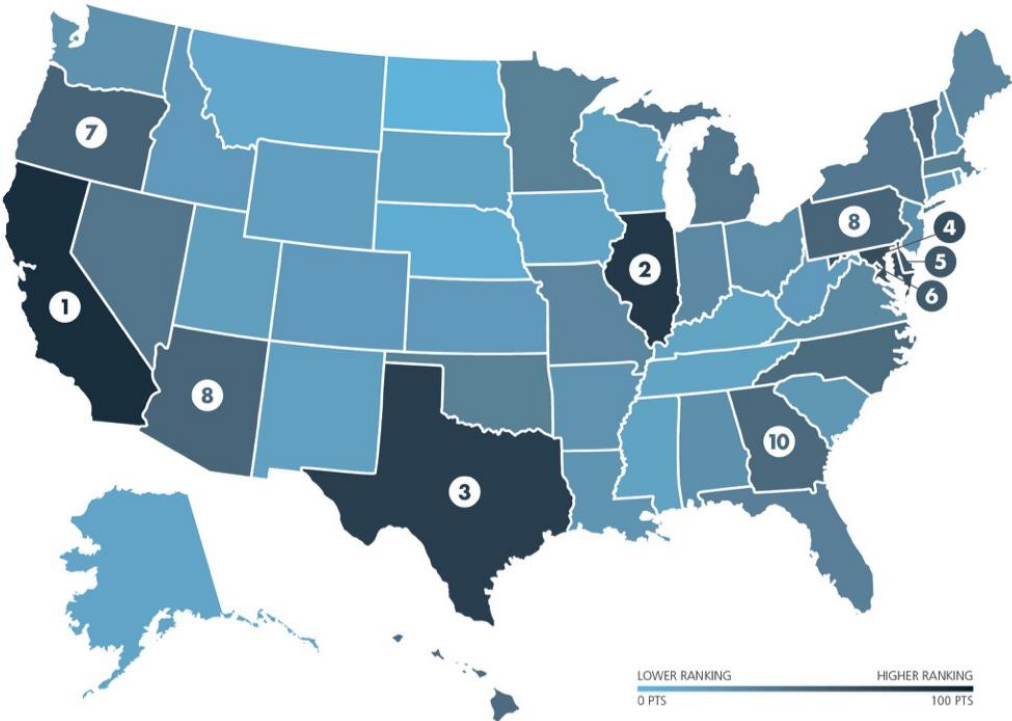
- Unleash the power of private capital
- Level the playing field for clean energy resources
- Align utility business models with desired objectives
- Modernize the electricity grid

# GridWise Alliance Members



# Grid Modernization Index Results

## OVERALL RESULTS



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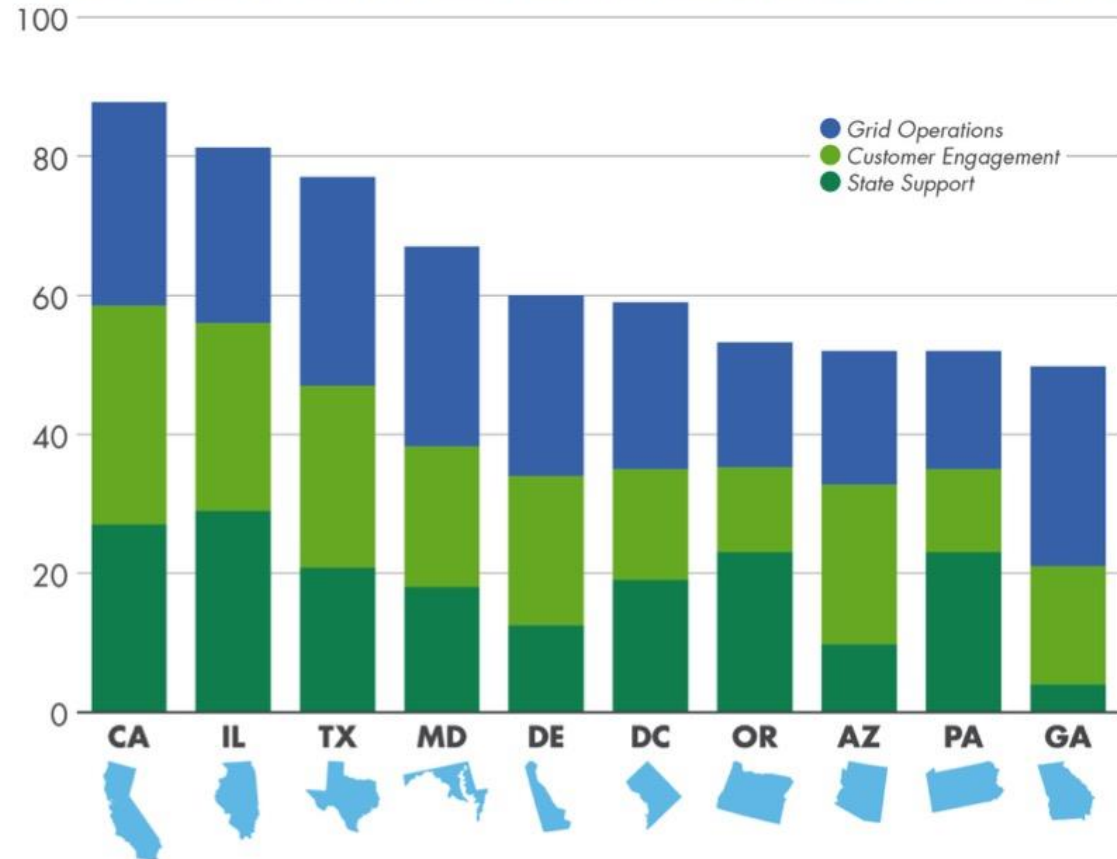
RANK	+/-	STATE	LEADERSHIP SCORE
1	1	California	87.8
2	1	Illinois	81.3
3	-2	Texas	77.0
4	1	Maryland	67.0
5	1	Delaware	60.0
6	2	Washington, DC	59.0
7	10	Oregon	53.3
8	1	Arizona	52.0
8	-4	Pennsylvania	52.0
10	3	Georgia	49.8
11	13	North Carolina	48.8
12	6	Hawaii	47.5
13	2	Vermont	47.3
14	-7	Nevada	41.8
15	-1	Michigan	41.5
16	7	New York	41.3
17	3	Florida	36.3
18	8	Minnesota	34.8
18	-6	Oklahoma	34.8
20	0	Massachusetts	34.5
21	-5	Maine	32.3
22	0	Missouri	31.0
23	-13	Virginia	29.5
24	5	Indiana	28.8
25	-6	Ohio	26.5
26	0	New Jersey	26.3
27	9	Alabama	25.5
28	11	New Hampshire	24.8
29	5	Washington	23.8
30	2	Arkansas	23.3
31	-6	Connecticut	22.8
32	14	Louisiana	21.5
33	-2	South Carolina	20.8
34	-2	Colorado	19.0
34	-23	Idaho	19.0
36	4	Kansas	18.8
37	7	West Virginia	18.5
38	-2	Utah	17.3
39	12	Wyoming	16.0
40	6	Wisconsin	15.0
41	4	New Mexico	14.8
42	-16	South Dakota	14.0
43	-2	Mississippi	13.8
44	-2	Kentucky	12.8
44	-9	Tennessee	12.8
46	-3	Iowa	12.3
47	-17	Alaska	12.0
48	-10	Montana	10.0
48	2	Rhode Island	10.0
50	-1	Nebraska	8.3
51	-3	North Dakota	3.3

# Grid Modernization Index Leaders

## The 10 Highest-Scoring States

- CA, IL, and TX retain the top spots
- The spread between the top states and lower states remains significant
  - 28 point spread exists between leading California and 5th place Delaware
  - Top 10 states with an average score 23 points higher than the next 10 states
  - 9 states with a score higher than 50 (out of a possible 100)
- Neighboring mid-Atlantic states Maryland, Delaware, and Washington D.C. took spots 4 to 6
- Oregon and Georgia each joined the top 10

**FIGURE 1: 3RD ANNUAL GRID MODERNIZATION INDEX: TOP 10 STATES**

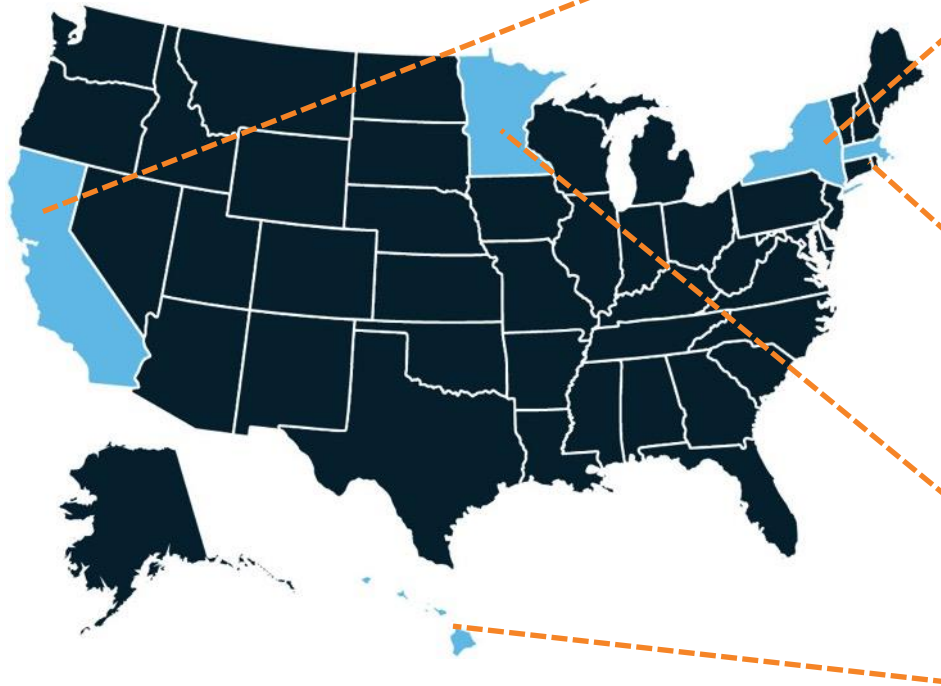


Source: GridWise Alliance and Clean Edge.

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# Major Grid Modernization Developments

## States Taking Innovative Action



- **CALIFORNIA** now requires its major investor owned utilities to submit distributed resource plans.
- **NEW YORK**'s landmark REV proceeding recognizes the need for advanced metering functionality as it works to update its energy sector.
- **MASSACHUSETTS** required its utilities to submit grid modernization plans - proposals include smart meters, time of use pricing, and DER management systems.
- **MINNESOTA** has finished Phase I of its e21 Initiative, which aims to help utilities recognize the new role that customers play.
- **HAWAII** increased its RPS to 100% by 2045. Its utilities have struggled to integrate more solar PV (as well as storage and other DERs).

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# Statistical Analysis

## What Impacts GMI Scores (and What Doesn't)

- States with high AMI deployment tend to have higher GMI scores
- States with high AMR deployment tend to have lower GMI scores
- Higher penetration of EVs and solar has some impact on GMI scores, but not a huge one
  - How this relationship changes over time will be interesting to see play out
- Factors that don't impact GMI scores: RPS/EERS, decoupling, average electricity price, per capita state GDP/income

	CORRELATION BETWEEN VARIABLE AND CATEGORY			
	STATE SUPPORT	CUSTOMER ENGAGEMENT	GRID OPERATIONS	OVERALL
Percent AMI		*	*	*
Percent AMR		*	*	*
Average Monthly Consumption (kWh)	*			

**TABLE 5: SUMMARY OF CORRELATIONS BETWEEN NUMERIC VARIABLES AND GMI CATEGORY SCORES**

	CORRELATION BETWEEN VARIABLE AND CATEGORY			
	STATE SUPPORT	CUSTOMER ENGAGEMENT	GRID OPERATIONS	OVERALL
Percent AMI		*	*	*
Percent AMR		*	*	*
Average Monthly Consumption (kWh)	*			
Average Monthly Bill (Dollars)				
Per Capita Real GDP				
Per Capita Real Income (Dollars)				
Solar: Total Residential Installations	*	*	*	*
Solar: Total Residential Capacity (MW)	*	*	*	*
Solar: Total Non-Residential Installations	*	*	*	*
Solar: Total Non-Residential Capacity (MW)	*	*	*	*
Electric Vehicles (Number of Vehicles)	*	*	*	*
Average Electricity Price (All Sectors)	*			

Source: Accenture, GridWise Alliance, and Clean Edge.

- High Positive Correlation (0.5 to 1.0)
- Low Positive Correlation (0 to 0.49)
- Low Negative Correlation (0 to -0.49)
- High Negative Correlation (-0.5 to -1)
- ★ Indicates Statistical Significance at the  $p=.05$  Level

# Key Takeaways

- 1 Funding investments in grid modernization is a challenge for both utilities and regulators
- 2 There is a growing gap in grid modernization between the leading states and those that have not yet started
- 3 Key factors associated with high GMI scores include:
  - AMI penetration
  - Electric market deregulation
  - Presence of demand response programs
- 4 Deployment of grid modernization technologies has progressed, but the full range of benefits has yet to be realized, particularly around customer empowerment
- 5 States and utilities need to consider dynamic rate structure reforms to fully unlock the benefits offered by the smart grid
- 6 The source of leadership of grid modernization efforts varies widely from state to state. There is no one-size-fits-all approach – so collaboration among stakeholders is essential



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**DISCLAIMER:** The state rankings included in the GridWise Alliance's 3rd Annual Grid Modernization Index (GMI) were developed based on publicly available information regarding state energy policies and electric grid operations including, but not limited to, customer access to usage information, meter deployments, rate structures, and state energy plans. In addition, stakeholder survey responses and interviews with regulators, policy makers and utility operations personnel were also used in the process of finalizing state rankings. The final state rankings reflect a summary of the inputs collected and are not intended to prescribe specific policy initiatives or grid modernization investment strategies.



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